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Reported are the results of a 20-day highly concentrated program of teaching mathematics, language arts, and human relations to disadvantaged fourth, fifth, and sixth grade students in Houston, Texas. This follow-up study is based on a sample of 80 students from the original group of 200. Findings show that: (1) there were no significant differences in school attendance and language arts grade point average between 1966-67 and 1967-68; (2) a significant difference was found in mathematics grade point average between the two years; (3) a significant progression in mathematics achievement was found but there was a regression in language arts achievement; and (4) differences in semantic distance (attitudes toward school processes) were not significant. (NH)

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U.S. DEPARTMENT OF
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A PROBLEM OF THE LONG RANGE EFFECTS OF A PROGRAM OF CURRICULAR AND ADMINISTRATIVE INNOVATIONS ON ACHIEVEMENT AND ATTITUDE OF DISADVANTAGED STUDENTS

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Houston, Texas

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U.S. DEPARTMENT OF
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I. SUMMARY

A. Problem and Objectives

1. Statement of the Problem

The implementation of the Civil Rights Act of 1964 has brought teachers into contact with students of diverse ethnic and social backgrounds for the first time. Attention should therefore be given to necessary administrative and curricular modifications growing out of the diversity of the student population and the inexperience of the faculty in these situations.

A twenty-day highly concentrated, tailored school program involving curricular and administrative innovations was held in the summer of 1967. An evaluation of this program indicated that the immediate effects were very positive.

The present project (#8-G-055) attempted to evaluate the long range effects of the 1967 program.

[1]Phase I and [2]Phase II concerned a population of 200 students from four economically deprived areas of Houston. [3]Phase III was concerned with a sample of 80 of the original 200 students who were, for all intents and purposes, an equivalent group.

2. Objectives

The objectives of the study were:

a. determining to what extent curricular and administrative innovations have enabled culturally different students to develop and maintain:

   (1) more positive feelings toward the learning processes;

   (2) more positive attitudes toward formal schooling as determined by attendance with that of a [4]control group; and

   (3) proficiencies in language arts and mathematics as indicated by grade point average.

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[1]Phase I - Pre-test group of 200 students in summer of 1967.

[2]Phase II - Post-test group of 200 students in summer of 1967.

[3]Phase III- Follow-up study, June, 1968 - December, 1968.

[4]Permission was given for the elimination of the control group and the substitution of home interviews.

b. determining the relationship between academic achievement and attitudes of disadvantaged students as measured by scales, questionaires and observation; and

c. determining the extent of growth or regression in mathematics and language arts as measured by achievement tests.

B. Procedures

The project attempted to study the long range effects of a highly concentrated, short-term tailored school program in which twenty teams of three teachers taught twenty groups of ten fourth, fifth and sixth grade students from four poverty areas of Houston.

The original study (Phase I and Phase II) was concerned with 200 fourth, fifth and sixth grade students who attended a special institute of twenty days duration in the summer of 1967.

The follow-up study (Phase III) was concerned with a sample of 80 of the original 200.

1. Data Collection

Four types of data were collected: (1) data from school records, i.e., grade point average, attendance, and mental ability scores; (2) scores from a semantic distance scale designed to assess attitude toward school processes; (3) scores from standardized achievement tests in mathematics and language arts (word knowledge and reading comprehension); and (4) data collected from home interviews, i.e., a.) parental attitudes, b.) parental perception of child's attitudes and c.) home environment.

2. Data Analysis

The data was analyzed through a multiple classification analysis of variance, and processed on the SIGMA 7 BCM Computer through the facilities of the University of Houston Computer Center.

3. Findings

a. attendance - no significant difference in school attendance was found between 1966-67 and 1967-68.

b. language arts grade point average, although there was some increase.

c. mathematics grade point average - a significant difference between means was found beyond the .06 level of confidence.

d. mathematics achievement - a significant difference beyond the .01 level of confidence was found between the means. Critical ratios indicated Phase I mean less than Phase II mean less than Phase III mean. (Progression)

e. language arts achievement

(1) word knowledge - a significant difference beyond the .01 level of confidence was found between means of Phase I and Phase III. Critical ratios revealed Phase I means greater than Phase III means. (Regression)

(2) Reading comprehension - a significant difference beyond the .05 level of confidence was found between means of Phase I and Phase III. Critical ratios indicate Phase I mean greater than Phase III mean. (Regression)

f. semantic distance - analysis of variance indicated that no significant differences existed among the means.

g. home visitation - data from the home visitation interviews revealed that no adult male lived in 19 of the 30 homes visited and 10 of the 19 mothers were unemployed. Twenty-three of the mothers percieved their child as liking school prior to the summer program, but experiencing a more positive attitude following the program. Twenty-two reported the child to have frequently mentioned the program during the nine months following. Parental ambitions for the child were usually not expressed, although when the parent did express an ambition, it was for a profession (six named nursing; others were lawyers, priest, and architect, for a total of 12 responses.)

The parents rated the summer program staff as excellent while rating the public school staff as good.

The thirty parents unanimously agreed that the summer program was beneficial to the children, and mentioned improvement in school work and social relations as an effect of the program.

II. INTRODUCTION

A. Statement of the Problem

The implementation of the Civil Rights Act of 1964 by the Houston Independent School District resulted in the complete desegregation of all grades by September, 1967. Consequently, Negro and white students and teachers, in some cases, came together for the first time. Attention, therefore, should be given to necessary curriculum and administrative modifications growing out of the diversity of the student population and the inexperience of the faculty in these situations. In other words, as the schools become integrated, many students, Negro and white, from impoverished areas are in classrooms taught by teachers untrained and unaccustomed to working with such pupils. It is assumed that the students from disadvantaged homes will be handicapped as far as academic achievement and social adjustment are concerned. In addition, it is anticipated that their attitudes toward school and the learning process will tend to be intensified. There is a dire need for intensive study of the factors related to the culturally different pupil's attitude in the teaching-learning situation and achievement in order to provide educators and educational institutions information fundamental to academic achievement and personal adjustment.

A proposal for the evaluation of the immediate results of a short-term (20 day), highly concentrated, tailored school program involving curricular and administrative innovations was submitted to the Regional Research Program Office in Dallas on June 21, 1967. The proposal, number G-7-083, was not funded, due to the late date of application. Subsequently, the project was funded by the University of Houston, the Hogg Foundation for Mental Health and the Harris County Community Action Association.

An analysis of the data from this research indicates that the immediate effects of the program were very positive. For example, each student gained an average of four months in mathematics achievement and an average of two weeks in language arts achievement. There is an immediate need to determine if this was, in effect, real learning. Such learning should result in changes of behavior in the actual classroom situation, which should be manifest in better attendance, better grade point average and a better attitude toward school. There is also an urgent need to determine if a measurable long-range relationship exists between academic achievement and attitudes of disadvantaged children as measured by scales, questionaires and observation.

A program such as the one described herein can only truly be evaluated in terms of the lasting effects on students.

B. Review of Literature and Related Research

The current focus upon the culturally different child has indicated that such children need (1) help in changing their attitudes toward achievement and school,[1] (2) teachers trained to be sensitive to their particular needs[2] and (3) more suitable methods and curriculums to fit their life-styles.[3] A review of the literature and research reveals, for the most part, a one-pronged approach to a multiple-problem situation. Brodie[4] and Woodruff[5] concluded from their investigations that attitudes toward school do have an effect on achievement; Williamson and Cole[6] supported the idea that social behavior of the able student may be a more potent determiner of school rank than his actual level of achievement;

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[1]Creswell, John L. and Dunn, Charleta J., "Using Programmed Instruction for Remedial Mathematics," The Catholic School Journal, 67 (May, 1967), pp. 60-62; Greenberg, J.S., "Attitudes of Children from Deprived Environment Toward Achievement," Journal of Educational Research, 59 (Oct., 1965), pp. 57-62; Kemp, Barbara H., The Youth We Haven't Served. Catalog #FS 5-280:80038 (Washington, D.C.: Government Printing Office, 1966), pp. 1-8; Kvarecenus, William, "Helping the Socially Unadapted Pupil in the Large City School," Exceptional Children, 28 (April, 1962), pp. 399-404; and Reissman, Frank, "The Overlooked Positives of Disadvantaged Groups," Journal of Negro Education, 33 (Summer, 1964), pp. 225-231.

[2]Bettelheim, Bruno, "Teaching the Disadvantaged," National Education Association Journal, 54 (September, 1965), pp.8-12; Cheyney, Arnold B., "Teachers of the Culturally Disadvantaged," Exceptional Children, 38 (Oct., 1966), pp. 83-88; Groff, P., "Dissatisfaction in Teaching the Culturally Deprived Child," Phi Delta Kappan, 45 (Nov., 1963), p. 76; and Marie, Sister Clare, "Project-Love," National Catholic Educational Association Bulletin, 62 (August, 1965,) pp. 508-513.

[3]Koenigsberg, S.P., "Teaching the Disadvantaged Youth," Educational Digest, 31 (April, 1966), pp. 10-13; Olsen, James, "Children of the Ghetto," High Points, 46 (April, 1964), p.25; and Sarvis, M.A., "Reactions of Children from Overcrowded Areas," Childhood Education. 39 (May, 1963), pp. 413-415.

[4]Brodie, T.A., Jr., "Attitude Toward School and Academic Achievement," Personnel and Guidance Journal, 43:4 (1964), pp. 375-378.

[5]Woodruff, A.D., "The Role of Value in Human Behavior," Journal of Social Psychology, 36 (1952), pp. 97-107.

[6]Williamson, R.G., and Cole, Charles, "Factors in Scholastic Performance: The Behavior Differential," Personnel and Guidance Journal, 45:3 November, 1966, pp. 248-253.

Shaw[7] and Gallagher[8] raised the question of the relationship between sex and underachievement; and Wright[9] and Frankel[10] reported the effect of family economic level upon academic achievement; and Barclay[11] and Havighurst[12] studied the connection of school achievement and aspiration to social class.

No attempt has been made to study the long-range effects of a short termed, but highly concentrated project involving the impact of a tailored school program with a team composed of both experienced and inexperienced faculty especially trained to work in desegregated school situations.

C. Objectives

The proposed study explored some long-range aspects of curricular and administrative innovations as they related to the academic achievement and attitude of students from impoverished areas. These innovations include team teaching, individualized instruction, programmed materials, extensive use of visual aids, concrete materials and human relations activities. The primary objectives included the following:

a. determining to what extent curricular and administrative innovations have enabled disadvantaged youngsters to develop and maintain:

(1) more positive feelings toward the learning processes;

(2) more positive attitudes toward formal schooling, as determined by attendance; and

(3) proficiencies in language arts and mathematics as indicated by grade point average;

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[7]Shaw, M.C., "Guidance for the Underachiever with Superior Ability," (Washington, D.C.: Government Printing Office, 1961).

[8]Gallagher, James J., "Sex Difference in Expressive Thought of Gifted Children in the Classroom," Personnel and Guidance Journal, 45:3 (November, 1966), pp. 248-253.

[9]Wright, John J., "The Impact of Perceived Stress on Academic Achievement When Family Income Level and Self-Concept Are Taken Into Account," Journal of College Student Personnel, 7:2 (March, 1966) pp. 113-117.

[10]Frankel, E., "Characteristics of Working and Non-Working Mothers Among Intellectually Gifted High and Low Achievers," Personnel and Guidance Journal, 42:8 (1964), pp. 776-780

[11]Barclay, James, "Interest Patterns Associated with Measures of Social Desirability," Personnel and Guidance Journal, 45:1 (Sept., 1966), pp. 56-60.

[12]Havighurst, Robert, Growing Up in River City, (New York: John Wiley and Sons, Inc., 1962) pp. 50-53.

b. determining the relationship between academic achievement and attitudes of culturally disadvantaged children as measured by questionaires, observations and home visitations;

c. determining the extent of growth or regression in mathematics and language arts as measured by achievement tests.

Null hypotheses to be tested were:

H_01: Because of experience with curricular and administrative innovations there are:

(1) no measurable differences in the students' feelings towards the learning processes;

(2) no measurable difference in the attitudes of students toward formal schooling; and

(3) no measurable difference in academic achievement in language arts and mathematics.

H_02: Because of experience with curricular and administrative innovations there are no measurable differences in growth or regression in mathematics and language arts.

III. METHODS

A. Description of the Population

1. Phase I, II Population

Two hundred students were chosen from four poverty areas of Houston by the local Office of Economic Opportunity. All were to be enrolled in the 4th, 5th and 6th grades in 1967-68. Of the total, 102 were Negro, 43 were Latin, and 55 were Anglo. One hundred four were male. They were transported each day from their homes to their classes at the University of St. Thomas.

2. Phase III Population

The population for Phase III consisted of 127 of the original 200, with about equal distribution among the four deprived areas. Since complete data could not be obtained on all of the 127 students, this report will be concerned with the 80 on whom complete data was obtained.

The data shown in Tables I and II records a marked similarity between the Phase I, II and Phase III groups. This trend is reinforced by the following:

1) the sexual composition of the two groups was 50.2% male and 52.5% male for Phase I, II and Phase III, respectively.

2) the mean I.Q. of Phase I, II was between 84-94, while the mean I.Q. for Phase III was 93.24. The range of the I.Q.'s was almost identical, i.e., 64-163 compared to 66-163 for Phase I, II and Phase III respectively; and

3) in Phase I, II 72% came from the 4th and 5th grades while in Phase III 79% came from these two grades.

It seems safe to state that the two groups were quite parallel so far as the categories indicated above are concerned.

TABLE I

AGE DISTRIBUTION

Age	Phase I and II	Phase III
9	16.45%	5.00%
10	23.37%	23.75%
11	30.30%	32.50%
12	19.48%	33.75%
13	9.52%	5.00%

TABLE II

ETHNIC DISTRIBUTION

Ethnic	Phase I and II	Phase III
Negro	65.80%	75.00%
Anglo	19.05%	12.50%
Latin	15.15%	12.50%

B. General Design

This project attempted to assess the long-range effects of a short, twenty-day highly concentrated program of innovative instruction which utilized team teaching, individualized instruction, programmed materials, extensive use of visual aids, concrete materials and human relations activities. The immediate effects of this program have been studied under a separate grant.*

In Phases I and II, the students were administered the California Arithmetic Test, Level 4,5,6, Form X and Form Y, respectively prior to and following the period of instruction to determine academic gain, if any, in arithmetic. The Metropolitan Achievement Test - Elementary and Intermediate Battery Form A & B was administered prior to and following the period of instruction in language arts, to determine academic gain, if any, in communication skills.

An attitude scale to determine the students' attitudes toward formal school learning situations was administered prior to and after the instructional period. (See Appendix A) A questionaire concerning the family background of each student was filled out by the teachers from information obtained from an interview with the parents.

In Phase III, 127 of the original 200 students were transported to the campus of the University of St. Thomas on a Saturday in early June, 1968. A Semantic Distance Scale (see Appendix A) and the California Achievement Test -- Grades 4-5-6- Form Y were administered this time. Previously, in mid-May 1968, the Metropolitan Achievement Test -- Word Knowledge and Reading Comprehension -- were administered in the schools attended by the sample.

In August, a random sample of 30 of the 80 students in the follow-up study was selected. The homes of these students were visited and an interview with the parents was conducted. From this interview, a form (see Appendix B) was filled out by the interviewers, on which was recorded pertinent information to be used in the study.

C. Data Collection

Four types of data were collected:

(1) data from school records, i.e., grade point averages in mathematics and language arts, attendance figures, and mental ability scores; (2) scores from a semantic distance scale designed to assess attitude toward school progress; (3) scores from standardized achievement tests in mathematics and language arts (word knowledge and reading comprehension); and (4) data collected from home interviews, i.e., a.) parental attitudes, b.) parental perception of child's attitudes, and c.) home environment.

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* See Statement of the Problem

D. Data Analysis

The data was analyzed through a multiple classification analysis of variance, and processed on the SIGMA 7 BCM Computer through the facilities of the University of Houston Computer Center.

IV. FINDINGS AND ANALYSIS

All two-hundred students who had participated in Phases I and II were contacted and asked to participate in the testing for Phase III. Of these, 127 volunteered to participate and were transported to the campus of the University of St. Thomas in early June 1968. There, they were administered the Semantic Distance Scale and the California Achievement Test in arithmetic (CAT). The Metropolitan Achievement Test -- Word Knowledge and Reading Comprehension (MAT) had been administered to them in their respective schools at an earlier date.

Eighty of the 127 tested were found to have "complete enough" data at all three Phases (I-Pre), (II-Post) and (III-Follow-up) for analysis.

After the eighty participants in Phase III had been identified, data on their attendance, grade point averages in mathematics and language arts and I.Q. scores were collected.

Structured home interviews were conducted for a random sample of 30 of the 80 Phase III participants.

A. Attendance

The mean absences for 1966-67 was found to be 19.26 days while the mean absences for 1967-68 was found to be 17.03 days. A T-test was performed on these data and no significant differences in school attendance was manifest. The null-hypothesis was accepted. It must be noted, however, that the Houston Independent School District is quite strict in the enforcement of its truancy laws. Also, the home interviews showed that illness was the only reported reason for absence.

B. Grade Point Average in Language Arts

On a four point scale, the mean grade point average in this area for 1966-67 was found to be 3.04 while the mean for 1967-68 was found to be 3.19. (Table III) A T-test indicated that no significant difference in the means existed. The null-hypothesis was accepted. One must realize that these data may be questioned due to the subjectivity of the grading and the "roughness of the measure". However, "no decline" in grade point average may be interpreted as positive, since deprived children are often found to regress as the increased emphasis on verbal efficiency takes place in the school.

C. Grade Point Average in Mathematics

The mean grade point average in mathematics for 1966-67 was found to be 2.88 while in 1967-68 it was 3.10. (Table III)

The T-test showed a significant difference beyond the .06 level of confidence. The hypothesis was rejected. (The T-tests of the original study indicated a gain in mathematics achievement significant at the .01 level.)

TABLE III

T-TESTS FOR ATTENDANCE AND GRADE POINT AVERAGE

N=80

Means	1966-67	1967-68	T-Test of Significance
Public School Attendance (Absences)	19.26	17.03	0.66
Language Arts: GPA	3.04	3.19	-1.599
Math: GPA	2.88	3.10	-1.96*

* Indicates a difference significant beyond the .06 level of confidence.

D. Semantic Distance Scale

Eighty students were administered the Semantic Distance Scale (Weaver) nine months after the close of the 1967 Summer Institute. The Scale consists of thirty-five items. Responses to each item consist of writing a number from 1 to 7 corresponding to the following continuum: strongly disagree, 1; neutral, 4; and strongly agree, 7. Positive items were weighted from 6 (strongly agree) to 0 (strongly disagree). Weights for negative items were reversed, and the student's score becomes the sum of the weighted alternatives; consequently, large scores indicate positive attitudes.

The Semantic Distance Scale means for the three Phases are presented in Table IV. Analysis of variance indicated that no significant differences existed between the means. The null-hypothesis was accepted.

TABLE IV

SUMMARY OF ANALYSIS OF VARIANCE FOR SEMANTIC DISTANCE PHASES I, II AND III

Source	SS	DF	MS	F
Subjects	180514.00	79		
Treatments	1850.00	2	925.00	1.61
Interaction	90954.00	158	575.66	
Total	273318.00	239		

Even though the null-hypothesis was accepted, it became evident as the individual scale items were analyzed that there was pertinent information to be had from this source. Consequently, an item analysis was performed and the results appear in Table V.

Phase III Semantic Distance Scores were examined in terms of the 30 highest scores and the 30 lowest scores. Each item was categorized as to being primarily concerned with attitude toward teacher, classroom, study, school or school rules to facilitate analysis. The items within each category were ranked from high to low for each Phase. (Columns 2-5, Table V) Each item was also ranked relative to the remaining items of the questionaire for the three Phases. (Table V, Columns 6-8)

Six items (13-18) were categorized as Teacher items. The Over-all rankings of these items were generally below 17 which denotes more negative attitudes when compared with the other four categories. Item 14, "Teachers often like other children best.", and Item 17, "Some teachers are unfair.", received negative over-all rankings for the three Phases. The With-in Category rankings for these items,(14, 17), were also negative with the exception of Item 17 which obtained a neutral with-in ranking for the upper Phase III group. Item 13, "Teachers think they're not treated correctly.", received the most positive ranking for the category. Item 18, "Some Teachers should be the student and the student should be the teacher.", received Over-all rankings of 17, 30, 26 for Phase I, II and III, respectively. The relative shift of the item could possibly be explained by the increased pupil involvement in the Program classroom. The teachers noted a positive attitude shift when students were responsible for the learning situation.

Items 2,3,4,5,6,32,33 were classified as Classroom. Items 2 and 32 were consistently ranked high in all rankings. Item 32, "I think I should be quiet in school so others can work.", was the most favored item for all overall and written rankings except the Phase II overall where it ranked 5. Item 2, "I enjoy going to class," received a consistent positive within category ranking and a maximum overall ranking of 10 for Phase III. Item 33, "School is a place to talk over the activities of the day", was ranked 28, 29, and 17 for Phases I II and III, respectively, in overall rankings. When compared with the response to item 32, it might possibly indicate some ambiguity in response on the part of the students.

In general, the items classified as Classroom received negative references, with item 5, "Classrooms are alright if you have friends there", receiving negative rankings (35,35,34) by all three phases. In view of the ethnic composition of the sample, the responses were not unexpected.

The general Category of Study received a high level of positive responses, with five of the items receiving rankings of less than 17. Item 22, "I study hard," received overall rankings of 4, 1, and 2 on Phase I, II and III, respectively.

TABLE V

SEMANTIC DISTANCE SCALE (Ranked, High-Low)

		RANK WITH-IN				RANK OVER ALL		
	Item	Phase I	Phase II	Phase III Upper	Phase III Lower	Phase I	Phase II	Phase III
Teacher	13	2	3	2	1	19	26	11
	14	5	6	4	4	32	33	32
	15	3	1	1	3	20.5	19.5	22
	16	4	2	3	6	27	24	31
	17	6	5	3	5	33	32	35
	18	1	4	5	2	17	30	26
Classroom	2	2	2	2	3	6	8	10
	3	6	6	4	2	29	34	7
	4	3	3	3	6	24	18	19
	5	1	7	7	7	35	35	34
	6	4	4	6	5	26	25	21
	32	1	1	1	1	1	5	1
	33	5	5	5	4	28	29	17
Study	22	1	1	2	1	4	1	2
	25	3	5	3	6	9	12	14
	26	7	7	7	2	22	17	25
	27	5	6	1	5	14	14	8.5
	28	4	2	5	4	10.5	7	13
	29	2	3	6	3	8	9	15
	30	6	4	4	7	18	11	18
School	1	7	4	3	3	20.5	13	8.5
	19	1	2	1	2	5	6	6
	20	2	1	4	1	7	4	4
	21	3	3	2	4	10.5	10	12
	23	4	6	5	6	12	19.5	20
	24	6	7	6	8	15	22	23
	31	9	9	9	7	30	31	29
	34	5	8	8	5	13	27	24
	35	8	5	7	9	25	16	27
School Rules	7	2	3	3	5	16	15	16
	8	6	1	1	1	2	2	3
	9	4	4	6	3	31	21	33
	10	3	6	4	6	23	28	30
	11	5	5	5	4	34	23	28
	12	1	2	2	2	3	3	5

Item 26, which dealt with the interference of extracurricular activities with school work, received negative rankings, overall and within for all three Phases. However, the Phase III within ranking indicates relative positive ranking for the lower group as opposed to the negative ranking for the upper group.

Items 1,19,20,21,23,24,31,34 and 35 are generally classified as School. Item 1, "Schools are fun places," shows an increase in positive overall ranking, receiving 20.5, 13 and 8 on Phase I, II and III, respectively. Both groups in Phase III placed this item in the same approximate within category ranking as the Phase II sample, which is relatively more positive than the Phase I within. Those items concerning school, in general, received positive rankings with the exception of item 31, which referred to friends and school, again echoing findings in similar items.

The six items classified as relating to School Rules received markings which seem consistent. Item 8, "We should always follow the school rules with courtesy", ranked 2, 2, and 3 overall and within rankings of 1 except for a negative rank of 6 for Phase I, Item 9, concerning breaking rules, received negative markings for the overall sample, but the lower group, Phase III, ranked it 3 within as opposed to a 6 within for the upper group.

The least favored items for the Phase III group clustered in the Teacher and Classroom categories with several items related to fairness of the teacher and friends in the classroom. Items concerning boredom in the classroom received lower scores for those in the lower attitude group while receiving neutral scores from the upper group.

E. California Arithmetic Test

The original population was administered the California Arithmetic Test (CAT), level 4,5,6, form X and form Y, respectively prior to and following the period of instruction to determine achievement, if any, in arithmetic. After a period of ten months form Y was readministered to 80 of the original population to determine long range effect on arithmetic achievement. A significant difference beyong the .01 level of confidence was found between the means. (Table VI) Critical Ratios, (Table VII), revealed Phase I mean less than Phase II mean and Phase II mean less than Phase III mean. The null-hypothesis was rejected. The gain in arithmetic achievement seemed to indicate a "carry-over" effect.

Thirty tests were randomly selected for an item analysis to parallel the previous analysis for the Phase I, II population. The CAT consists of seven sub-tests involving concepts, symbol recognition, problem solving, and the four fundamental operations.

TABLE VI

SUMMARY OF ANALYSIS OF VARIANCE FOR CAT SCORES
PHASES I, II AND III

Source	SS	DF	MS	F
Subjects	48423.62	79		
Treatments	5447.56	2	2723.78	27.23*
Interaction	15802.44	158	100.02	
Total	69673.62	239		

*Indicates a difference significant beyong the .01 level of confidence.

TABLE VII

CRITICAL RATIOS

For Significant F ratios

	Phase I/Phase II	Phase II/Phase III	PhaseI/PhaseIII
MAT Word Knowledge	-3.24*	0.521	-2.735*
MAT Reading Comprehension	-2.59**	-1.66	-0.929
California Achievement Test	3.114*	4.24*	7.35*

*Indicates a difference significant beyond the .01 level of confidence
**Indicates a difference significant beyond the .05 level of confidence

TEST #3

Section A — Section A consists of 15 items which require knowledge of place value, writings of amounts of money, Roman numerals and fractions. The range of degree of difficulty was from 90% to 3%. Item 7 which was answered correctly by only eight of the thirty students required the recognition of a monetary value, namely, forty dollars and six cents. Other items receiving relatively small degrees of difficulty were not attempted by all testees. These items required judgment as to size of fractions or decimals. Item 13 presented the greatest difficulty to the sample and required selection of the smallest number from a collection of whole numbers and mixed decimals.

Section B —Section B, dealing with the four basic operation symbols and symbols for measurement presented very little difficulty, receiving a degree of difficulty range of 100% to 10%. Items 17 and 22, which required recognition of an addition equation and the multiplication symbol, respectively, received correct responses from the thirty testees. Two items, 29 and 30, had a degree of difficulty less than 30%. These items required recognition of the symbols for pi and square root which are possibly invalid items for the sample.

Section C — Fifteen problem solving items involving one-step simple addition, multiplication, subtraction and division to percentage and interest calculations comprise Section C. Item degree of difficulty ranged from 90% to 3% with 9 of the fifteen receiving D.D.'s below 30%. One step addition, subtraction and multiplication problems presented little difficulty but when two step problem solving or calculations involving fractions, decimals or measurement were required, the degree of difficulty was at or below 30%.

TEST #4

Section D — Skill in addition of whole numbers, fractions, decimals, and time measurements are measured in Section D. Ten of the twenty items received a Degree of Difficulty levels below 30%. Item 54 which required horizontal addition of monetary values seemed to present the greatest difficulty for the sample, (7%) with items 61, 60, 64 and 65 also receiving few correct responses. These items consisted of addition of mixed numbers, mixed numbers and decimals, horizontal addition of decimals, and fractional years. Other items involving horizontal addition also presented difficulty. However, the over-all difficulty of addition was less when compared with the sections concerning the remaining three operations.

Section E — The twenty items consisting of subtraction of whole numbers, fractions and decimals ranged in difficulty from 83% to 3% indicating a slight increase in difficulty with subtraction as compared with addition.

Four items required horizontal subtraction (74,82,83, and 84) and had degrees of difficulty below 20%. Fractions with like denominators presented little difficulty but a sharp increase in difficulty was exhibited when unlike denominators, decimals or linear measurement were involved. Again ten items received D.D.'s below 30%.

Section F — The twenty items involving multiplication ranged in degree of difficulty from 67% to 3% with 14 items below 30%. Multiplication of fractions, mixed numbers and linear measurement seemed to present the most difficult tasks. Items 103 and 104, which required multiplication of decimals, received D.D.'s of 17% and 20% respectively which is relatively low but significantly higher than 3% which was the D.D. for item 102 which involved mixed numbers.

Section G — The most difficult of the subtests seemed to be Section G which attempted to measure skill in division. The range of Degree of Difficulty was 67% to 3%. Fourteen of the twenty items received levels less than 30%. Twenty of the 30 testees in the sample responded correctly to the first four items of the subtest while for the remaining sixteen items, ten or less responded correctly to any one item. Division involving anything other than basic multiplication facts (divisor less than nine and dividend less than 80) presented difficulty to the sample.

F. Metropolitan Achievement Test

Two of the language arts subtests of the Metropolitan Achievement Test battery, Form Bm, were administered to the Phase III population. Word Knowledge and Reading Comprehension were selected on the basis of findings of the original study.

1. Word Knowledge

A significant difference beyond the .01 level of confidence between the means was found with Phase I mean greater than Phase II mean and Phase I mean greater than Phase III mean. The null-hypothesis was rejected. However, regression was indicated. (Tables VII, VIII)

A random sample of thirty was to paralled the original study's item analysis.

The Word Knowledge subtest, composed of 55 incomplete sentences for which students must choose a word from a multiple choice list of four words, was completed by two thirds of the population. The range of Degree of Difficulty (D.D.) was 79% to 10% with 17 items receiving D.D.'s below 30%. Fourteen items received incorrect responses from over two thirds of the sample. (These items were among the last twenty of the 55 items and contained material which was possibly unfamiliar to them.)

The most difficult items (45,53,54,52,39) required selection of a synonym for the words testament, onslaught, relish, lunge and gaudy. The synonym examination was selected most frequently for testament, opening for onslaught, and force for lunge. The only items answered correctly by over two thirds of the sample were 3 of the first four items.

2. Reading Comprehension

A significant difference beyond the .05 level of confidence was found between the means. Analysis of critical ratios revealed Phase I mean less than Phase II and Phase III means. The null-hypothesis was rejected, and regression was again indicated. (Tables VII, IX)

TABLE VIII

SUMMARY OF ANALYSIS OF VARIANCE FOR MAT WORD KNOWLEDGE
PHASE I, II AND III

Source	SS	DF	MS	F
Subjects	17578.62	79		
Treatments	306.31	1582	153.16	5.36*
Interaction	4514.38	158	28.57	
Total	22399.31	2019		

* Indicates a difference significant beyond the .01 level of confidence.

TABLE IX

SUMMARY OF ANALYSIS OF VARIANCE FOR MAT READING COMPREHENSION
PHASE I, II AND III

Source	SS	DF	MS	F
Subjects	5843.94	79		
Treatments	160.00	2	80.00	3.43*
Interaction	3687 .31	158	23.34	
Total	9691.25	239		

* Indicates a difference significant beyond the .05 level of confidence.

The Reading Comprehension subtest is composed of seven stories followed by open-ended statements with multiple choice responses. Occasionally, the correct response is a word or phrase in the story, but many of the responses require deductive reasoning or contextual definitions of words. Degree of Difficulty ranged from 76% to 16%. Items requiring naming the story (4, 13, 35, and 36) received D.D.'s at or below 33%. Of the 17 items found to be the most difficult for the testees, five were items requiring determination of a synonym for a word in the story; eight of the 17 items required deductive reasoning.

Story VII, which was about the manufacture of glass, presented the greatest difficulty to the sample which could possibly be attributed to the topic. Responses to the items seemed to be in respect to previous experience rather than the content of the story. For example Item 42, "A high degree of transparency is least necessary in glass used for ---" received eleven responses of "light bulbs".

The Phase I, II sample analysis seemed to indicate that vocabulary and deductive reasoning were the major causes for error. The present analysis seems to indicate that the same difficulties persist.

G. Home Interviews

A random sample of thirty of the eighty participants of Phase III was selected from home interviews. Parental views have been shown to have an influence on the attitudes of the children. Although the interviews were not structured to delve deeply into parental attitudes, the parent's perception of the child's attitude toward teachers and school and selected factors concerning the home environment may be considered indicative of a general parental attitude.

The interviews consisted of questions in seven areas: adults present in the home, attitude of the child toward school work, reasons for school absences, study environment, parental ambitions, parental attitude toward the child's teachers, parental attitude toward the summer program.

TABLE X

TABLE OF MEANS

	Phase I	Phase II	Phase III
CAT	42.70	47.60	54.32
MAT Word Knowledge	22.31	19.56	20.00
MAT Reading	17.75	15.77	17.04
Semantic Distance	123.74	117.42	122.75

In 19 of the thirty homes visited there was no adult male living in the home, and 10 of the mothers were unemployed. When a comparison of the responses of the "single adult" homes with the "two adult" homes was made no differences in response were noted.

Analysis of variance for the interview population, "single adult" home versus "two adult home on the CAT, MAT and Semantic Distance Scale indicated that no significant differences between the means existed. The lack of a male adult in the home seems to have had no effect on attitude, arithmetic achievement, or language arts achievement.

Twenty-three of the mothers perceived their child as liking school prior to the summer program but experienced a more positive attitude following the program. Twenty-two reported the child as having frequently mentioned the Program during the nine months following.

Only 8 children were reported to have a regular time for study while 12 had a regular place to study. Only three reported the existence of a quiet, well-lighted place to study. Most of the children (26) received supervision from parents or older children while studying. Several parents purchased supplementary materials and study aids for their children but did not provide regular time or place for study or physical conditions conductive to study.

Parental ambitions for the child were usually not expressed. When the parent did express an ambition for the child it was a profession. (Six named nursing, others were lawyer, priest and architect for a total of twelve responses.)

The staff of the summer program was considered to be excellent as compared with a rating of good for the public school staff. The home interviews conducted by the Staff teachers were mentioned favorably by the parents.

The thirty parents unanimously agreed that the Institute was beneficial to the children and mentioned improvement in school work and social relations as an effect of the Program.

Interviews of this form may be questioned as the reticence of the parent to be critical may prevent valid responses. However, the almost total lack of criticism may indicate that the children presented the Program and the teachers in a favorable light to the parents. The reported frequency of the child mentioning a four-week Program over a period of approximately 10 months would tend to suggest that the child was positively influenced.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

In general, the analysis of data would seem to indicate that for the population of this study, a short-term, highly structured program of curricular and administrative innovations had very little, if any, long rnage effect on attendance and grade point average in language arts. This is not surprising, for the original study[13] showed only a slight gain in language arts achievement. However, since no decline in grade point average was noted, this may be interpreted as positive, since disadvantaged children frequently regress as the increased emphasis on verbal efficiency takes place in the classroom.

An increase in grade point average in mathematics was found to be significant beyond the .06 level. This seems to indicate a decided carry-over effect, particularly since the original study showed a gain in mathematics achievement significant at the .01 level.

Many studies have shown that disadvantaged children tend to regress in communication skills the longer they stay in school. The population of this study supports this tendency since significant differences in means was found at the .01 and .05 levels for Word Knowledge and Reading Comprehension, respectively. This difference was due to regression on the part of the sample, since Phase I was greater than Phase II was greater than Phase III.

Conversely, analysis of variance showed highly significant differences between the means on the California Achievement Test in Arithemtic. These differences were in a positive direction, and reflected the gains in arithmetic achievement of the original study. It would seem, therefore, that for this population, the summer program had a decided long range effect on mathematics achievement. It is surmised that much of this may indeed be due to the innovations in mathematics used in the summer program, which resulted in a positive change of attitude toward mathematics on the part of the students.

Item analysis of the Semantic Distance Scale indicated the least favored items to be in the areas of Teacher and Classroom, with several of these items related to fairness of the teacher. This could possibly be interpreted as the tendency of lower-class children to resent the middle-class values of the teacher. Studies have shown that the social standing of the child has more to do with the grade assigned by the teacher than the measured achievement of the child.

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[13] Creswell, John L. and Dunn, Charleta, Teaching Under Pressure -- An Analysis of Data Collected in the School Desegregation Institute, Summer, 1967, University of St. Thomas Press and W.S.O.E., February, 1968. 34 pp.

An analysis of the data obtained from the home interviews revealed some interesting results. The lack of a male adult in the home seems to have had no effect on attitude, arithmetic achievement, or language arts achievement of the population.

The parents indicated that the summer program was beneficial to the students in the areas of improvement in school work and improved social relations.

B. Recommendations

Based on the results of this study, the following recommendations are made:

1. That another summer program of this type be held and that a research study be formulated which would utilize a control group for the purpose if identifying certain pertinent teaching strategies;

2. That a longitudinal study of several years duration be carried on whereby a similar population be given several summer programs of this nature to see if there is any decrease in school dropouts as a result, and

3. That the parents of disadvantaged children be given training in language arts, mathematics and human relations in order to help them better understand the goals of our educational system.

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HOME VISITATION FORM

1. Name of Student: _____

2. Siblings:

Sex	Age	Education

3. Adults in the home

	Occupation	Education
FATHER		
MOTHER		
OTHER (SPECIFY):		

4. Attitude of child towards school work:
   a. Did child like school before Institute? (yes, no)
   b. Did child change attitude toward school in a favorable direction since Institute? (yes, no)
   c. Did child mention Institute last year? Frequently ___
      Some times ___ Did not mention ___

5. Reasons for absences at school:
   a. Duties at home (baby sitting, etc.)
   b. Opportunities for employment outside home
   c. Lack of clothing
   d. Illness
   e. Family trips
   f. Other (please specify)

   (rank as to most frequent reason, 1st, 2nd,...)

6. Study Environment:
   a. Does the child have:
      (1) regular study time (yes, no)
      (2) regular place to study (yes, no)
      (3) quiet, well lighted place to study (yes, no)
      (4) additional aids to study such as supplementary materials purchased by parents (yes, no)

   b. Supervision of study:
      (1) parent or adult gives help
      (2) older child gives help
      (3) parent gives no help as to subject matter, but gives verbal or physical enforcement to study

7. Parental Attitudes:
   a. Parent's ambition for child's future employment _____
   b. Do parents feel child will achieve this goal? _____
   c. Attitude of parent toward teachers:
      (1) teachers in Institute were ___ excellent, ___ good, ___ fair, ___ not satisfactory
      (2) teachers in public school are: (check one)

pre-Institute	post-Institute
excellent	excellent
good	good
fair	fair
not satisfactory	not satisfactory

      (3) Principal of school ___ excellent, ___ good, ___ fair, ___ not satisfactory

   d. Would parents enroll other children and/or child in a similar institute? _____ Why? _____
   _____

   e. During the interview did the parent make any statement as to race? _____
      (1) If so, how many statements? _____
      (2) Number of affirmative statements? _____
          Number of negative statements? _____
      (3) Were statements concerning race of students _____
          race of teachers _____ race of the child _____?

Name _____

SEMANTIC DISTANCE QUESTIONNAIRE

Directions:

There are 35 statements in this scale. Please show your own personal feeling of each statement by circling a number from 1 to 7 beside it, as follows:

Strongly disagree			Neutral			Strongly agree
1	2	3	4	5	6	7

For example, if you strongly like a sentence, circle a number 7; if you strongly dislike the statement, circle the number 1. If you don't care either way, circle a number 4. If you agree or disagree less strongly, use the numbers 2, 3, 5, and 6.

Please do not put what you should believe or what other people (like teachers, parents, and others) want you to believe. Try to put what YOU really think or feel about these sentences.

Work fast. Do not worry too long over any. Circle a number in every one. REMEMBER: You need not fear that your feelings will be exposed. No one in this school will ever see your paper. Your teachers will be given only general summaries of group answers. When you finish, hand your paper to me.

Strongly dislike or disagree			Neutral Don't Care		Strongly agree or like		
1	2	3	4	5	6	7	1. Schools are not fun places.
1	2	3	4	5	6	7	2. I enjoy going to class.
1	2	3	4	5	6	7	3. A classroom is a place to put in your time.
1	2	3	4	5	6	7	4. When I am in a school room, I think of what is going on at home.
1	2	3	4	5	6	7	5. Classrooms are alright if you have friends there.

SEMANTIC DISTANCE QUESTIONNAIRE (Cont.)

Strongly dislike or disagree			Neutral Don't Care		Strongly agree or like		
1	2	3	4	5	6	7	6. There is too much being friendly to the teacher in classrooms.
1	2	3	4	5	6	7	7. Rules make school seem like a jailhouse.
1	2	3	4	5	6	7	8. We should always follow the school rules with courtesy.
1	2	3	4	5	6	7	9. Some rules were made to be broken.
1	2	3	4	5	6	7	10. Some rules are dumb and unfair.
1	2	3	4	5	6	7	11. I don't like having so many rules.
1	2	3	4	5	6	7	12. We should help make other do what the rules say.
1	2	3	4	5	6	7	13. Teachers think they're not treated correctly.
1	2	3	4	5	6	7	14. Teachers often like other children best
1	2	3	4	5	6	7	15. Some teachers are lazy.
1	2	3	4	5	6	7	16. Sometimes teacher's rules are just a little strict and dumb.
1	2	3	4	5	6	7	17. Some teachers are unfair.
1	2	3	4	5	6	7	18. Some teachers should be the student and the student should be the teacher.
1	2	3	4	5	6	7	19. I like school.
1	2	3	4	5	6	7	20. I think it is an honor to attend school.
1	2	3	4	5	6	7	21. I think school is dull.
1	2	3	4	5	6	7	22. I study hard.
1	2	3	4	5	6	7	23. I think there is more fur other places than schoc
1	2	3	4	5	6	7	24. I like school closed.
1	2	3	4	5	6	7	25. I don't like studying.
1	2	3	4	5	6	7	26. Studying bothers my other plans and activities.
1	2	3	4	5	6	7	27. There isn't any fun to study.

SEMANTIC DISTANCE QUESTIONNAIRE (cont.)

Strongly dislike or disagree			Neutral Don't Care		Strongly agree or like		
1	2	3	4	5	6	7	28. I put school work above most other things.
1	2	3	4	5	6	7	29. I think I should give up fun and play for schoo work.
1	2	3	4	5	6	7	30. School work is trouble.
1	2	3	4	5	6	7	31. School is a place to see your friends.
1	2	3	4	5	6	7	32. I think I should be quiet in school so others can work.
1	2	3	4	5	6	7	33. School is a place to talk over the activiti of the day.
1	2	3	4	5	6	7	34. There isn't enough fun in school.
1	2	3	4	5	6	7	35. School is dull and tire-some most of the time.